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ABSTRACT

People are beings that seem to have, and to think about, spiritual, transcendent experiences. But some are psychologists who have historically found it very difficult to integrate their spiritual, yearning selves, or the spiritual selves of those they see. Psychologists may want to understand the processes involved in complex transcendent, spiritual, new-paradigm understanding, and how such thinking becomes part of the skills and experience of the normal, non-pathological developing human. Four sample hypotheses could test some relations between postformal cognition and high-level spiritual development: (1) individuals who report a unitative state of consciousness show postformal operations; those not reporting unitative states may or may not show postformal operations; (2) those reporting unitative states have highly efficient styles of processing large amounts of conflicting information and function better in the face of overload than those not reporting such states; (3) middle-aged and older persons are more likely to describe spiritual searches which link them with others and which operate to give a unity and meaning to their lives than younger persons; and (4) choice of exposure to life events or workshops or psychotherapy where one challenges the meaning of one's life or the grounds of one's life or the grounds of one's "self" are likely to allow the person to transition to both postformal thought and spiritual development. (ABL)

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Development and Yearning:
Cognitive Aspects of Spiritual Development

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Running head: Cognitive aspects of spiritual development

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We are thinking beings. When we develop, when we feel, when we yearn, we think about those changes, feelings, yearnings. And we are beings that love sharing good stories (see Chinen, 1992). When we think, we want it to make sense, to us and to others, too, as shared cognition.

We are beings that seem to have, and to think about, spiritual, transcendent experiences. We point to our saints and mystics, and some of us struggle to find union with God or universal consciousness. But some of us are "psychologist" beings who have historically found it very difficult to integrate their psychologist selves with their spiritual, yearning selves or the spiritual, yearning selves of those they see. Some of us secretly admire Mother Teresa, Buddha, Christ, Meister Eckhard, but fear these represent irrational dreams. Are we less or more rational than the average person? Are we less as psychologists because we dare ask? It may be time now, at this point in the history of our profession, to try to make that integration.

We see all around us that the old ways of describing reality are being reformulated and expanded because they are too limited for current complexity. New interactive, online information-exchange models begin to change the university; televised images expand our identification to a global one; quantum physics gives us a larger and stranger universe; virtual reality expands our senses; chaos theory gives us a new "orderly" disorder to play with; and the ideas of Gaia, body/mind interactions and

cooperative biological evolution suggest the larger whole reflecting on itself and co-creating as "team," of sorts. NOW we study the evolution of consciousness (Ornstein, 1991). How can we even think about these things, which violate the ordinary logic of our minds? How can we make any cognitive sense of our spiritual and new-paradigm realities?

Today I'd like to suggest a way to make these integrations within our studies of lifespan cognitive development. As psychologists and as scientists we may want to understand the processes involved in complex transcendent, spiritual, new paradigm understanding, and how such thinking becomes part of the skills and experience of the normal, nonpathological developing human.

Students of lifespan cognitive development have recently focused on more complex models, like the development of Piagetian postformal thought (Arlin, 1975; Basseches, 1984; Commons & Richards, 1984; Koplowitz, 1984; Labouvie-Vief, 1984; Perry, 1975; Sinnott, 1981, 1984). Most recent works appear in Commons, Armon, Kohlberg, Richards, Grotzer and Sinnott, 1990; Commons, Sinnott, Richards and Armon, 1989; Demick, 1992; Sinnott, 1989abcd, 1991ac, 1992ab, and in press abcdef; and Sinnott and Cavanaugh, 1991. We have begun to explore the relationships between such complex thinking and wisdom, transcendence, unitive states of consciousness, and awareness of multiple realities in many different contexts of life including: clinical psychology

(Armstrong, 1991); teaching (Lee, 1991; Sinnott, 1992a and in press c); international development (Johnson, 1991; Tanon, 1991); creativity (Sinnott, in press a); problem solving (Sinnott, 1984, 1988, 1989abcd, 1991abc, 1992ab, in press abcdef); couple relations (Luszcz & Orr, 1991; Rogers, Sinnott & Van Dusen, 1991); sex roles (Sinnott, 1987); and intragroup conflict (Sinnott, 1984, 1991c, 1992b). It is possible that as psychologists we can shift between analytic and synthetic approaches to allow the experimental model to inform our understanding of experiences like spirituality. Specifically, we need to explore how ideas of transcendence and multiple realities and "higher" meanings in life appear in our cognitive models. The purpose of this paper is to explore points of potential interface between cognition and spirituality, to specifically apply postformal theory to the knowing of such experience, and to suggest a few hypotheses and difficulties associated with such interfaces.

The task of integrating the reality of spirituality and the reality of lifespan cognitive development reflects the very process we are trying to understand: How can two disparate frames for reality coexist in a coordinated way in the human mind? How can humans function on a day to day, practical level with conflicting basic frameworks underlying cognitive processes? We know that individuals do this in many ways from our own experience and from descriptions by others. We know these

multiple realities occur in simple and in complex cognitive developmental stages (e.g., Piaget's mechanisms of assimilation and accommodation handle multiple realities at even the sensorimotor stage). Physicists have to operate in both "big picture" and "local" realities; clinicians and people in love simultaneously see the person they are with as real and as potential; mystics report being "in this world" and "not of this world" at the same time, while the world itself is seen as both real and as "maya" (illusion). Millions of adults have been intrigued by books like Richard Bach's Illusions (1977), even when they find little meaning in standard psychology. What is the cognitive logical process that allows this transcending of multiple realities and even of "self" to arrive at a healthy unitative state? When Jean Valjean asks, in Les Miserables (Hugo, 1938), who he is, convict and criminal, or a pillar of the community, or one whose life has been "purchased" by God for good works, he must develop to the point where his "self" is part of the larger, unitative "self" that is more than those lesser selves. (The concept of self will be explored in relation to postformal thought in a paper in progress.)

This takes thinking. I propose that it takes postformal thought, and that it is time for us to experimentally study this thought process in order to understand spiritual development.

Points of Potential Interface: Cognition and Spirituality

There are four potential points of interface between these two

domains, points from which it would be easy to start our studies: the form of this logic; the developmental process to attain this thought; the connection with emotion and will; and the multiperson, cooperative cognition element. The scientist can examine the information processing and the cognitive style of any thinker, including the thinker in unitative state. The scientist can elaborate on the logical processes being used by the thinker (as Piaget elaborated on such processes in infants and scientists) whether the thinker is Blake or St. Teresa or an adolescent or Buckminster Fuller or an Alzheimer's disease patient. Just as Marsha Sinetar (1986) used questionnaires and the methods of organizational psychology to study the process of becoming self actualized, cognitive psychologists can examine the memory, problem solving, and logic of the healthy spiritually questing person. Tart (1983) has explored the cognitive processes of those in many states of consciousness; we can explore the logics of mystics and spiritually questing persons in everyday settings.

The developmental process that arrives at a multi-reality logic state also is ripe for study. Writers like Pearce (1973) have begun, but where are the cognitive developmentalists? As the world seems to be evolving, large problems will demand the use of all the abilities of the human mind. A state of oneness with all of life may be conducive to peace and the solution of the world's large problems, when it is coupled with logical and

practical abilities. How do humans achieve the logic to act as enlightened ones? This is a question for developmental psychologists, if we claim it.

A third way to approach the cognitive study of spiritual development is to tap the methods that incorporate emotion and will (or intention) into cognition. Emotional elements in processes like problem solving are difficult to study but some of us (e.g., Bastick, 1982; Isen & Shalker, 1982; Rogers, Sinnott & Van Dusen, 1991; Sinnott, 1991a) have begun to incorporate these factors.

The fourth set of studies may be just as difficult, but also possible. Studies of cooperative cognition and multiperson problem solving are fairly rare in standard cognitive experimental settings where variables can be controlled in ways that are not practical in organizational or educational settings. Yet they are recommended (e.g., Meacham and Emont (1989) and sometimes are done (e.g., Laughlin, 1965; Laughlin & Bitz, 1975; Laughlin, McGlynn, Anderson & Jacobson, 1968; Rogers, Sinnott, & Van Dusen, 1991. I think it would be difficult to capture the logic of a respondent reasoning in a unitative state (i.e., at one with all of life) without implied or actual input of other thinkers with whom the first shares (if you will) a "self" and a joint reality. Psychologists could describe, at least imperfectly, the thinking processes of the larger "self" (of many "selves"), although I may be making an error of logical type here

(see Gowan, 1980). These four areas (process, development, emotional effects or cognition, multiperson cognition) at least offer a promise of research possibilities in our study of cognitive aspects of spirituality.

Postformal Thought, Cognition and Spirituality

I propose postformal thought is a necessary cognitive skill for deep, mature spiritual development, and that it can be found in the thinking of "wise ones," "saints," and mystics. I propose that it is the form logic takes in these mature thinkers, and that it develops through relationship with others, God, the universe. It includes the union of mind and emotion, and a modified concept of "self."

What is this thought? How must an adult structure thinking, over and above the operations of the Piagetian formal operational adolescent, in order to optimally be in touch with reality and to survive? Two skills seem necessary. The first is cognizance of interpersonal co-created reality. The second is knowledge of how to rise above a series of conflicted truths to choose among them. Is there anything special or complex about the operations that would underlie those skills? Are they different from Piaget's concrete or formal operations on physical relations?

There is at least one important difference to these postformal skills (Sinnott, 1984). It is the concept of necessary subjectivity which includes the knowledge of one's own emotions and thoughts to the extent that we know we see the world

through our own filters. Knowledge of physical relations, such as number, volume, conservation, binary relations, and transitivity, are the result of abstractions from action on the physical world (Furth, 1969). Practically speaking, physical relations are objectively present in reality (at least on a "local," small scale) (Sinnott, 1981) and are not the creation of the observer. The knower structures physical reality without seriously changing the real physical phenomena. Interpersonal relations, in contrast, are mainly a reflection of how people interact socially and know this interaction. Interpersonal relations seem to change constantly in their reality as a function of their being known or perceived in different ways by different individuals in the relationship. They are inherently creative (Sinnott, in press a).

Postformal operations form a stage in a developmental hierarchy of cognitive operations that goes beyond Piagetian formal operations. As such, they construct a system of formal operational systems, or metatheories. Relativistic operations permit selection of one formal operational system among many, based on a necessarily subjective selection of a priori's, or "givens." This selection occurs in a situation where several contradictory formal operational systems could apply. Formal operations presume logical consistency. In contrast, relativistic operations presume subjective selection among logically contradictory formal operational subsystems, each of

which is internally consistent. They presume both creative idea production and creative appropriate application.

The postformal stage of relativistic operations presupposes Piaget's findings (summarized in Furth, 1969; Inhelder and Piaget, 1958) that the developing child passes through the following stages of cognitive growth at an individual rate in an invariant order: sensorimotor, preoperational, concrete operational, and formal operational. Piaget's analysis of formal operational thought provides sufficient structure to describe scientific thought up to and including the operations of Newtonian physics. It is insufficient, however, for the description of Einsteinian physics or general systems theory (Miller, 1978). The intellectual operations used by contemporary physicists can and may be used by other adults in other areas of life. Relativistic self referential postformal operations are a description of how this may be accomplished because they permit sophisticated, necessary subjectivity to be ordered within complex adult thought to solve illstructured problems (Churchman, 1971) (see Sinnott, 1981 for an overview of relativity and quantum physics theory and this relativistic thought).

Postformal thought has social implications. First, an individual reasons that if this choice of reality is necessarily partly subjective, perhaps other choices about reality are, too. The individual next reevaluates other formal systems already in use. Then, several persons together judge the "best-fit" system

in a case where no system completely fits a reality that involves them all and is seen somewhat differently by each. Finally, group explorations concerning system choice lead to a consensus on the formal reality system to utilize in a given case. Necessary subjectivity leads to a collective cognition and collectively agreed upon reality. So, shared invariants--i.e., agreed-upon metrics, logic, a priori's, parameters, and so on--persist beyond an individual or a group. (Such shared referents may become a dominant philosophy or culture of belief if the necessary subjectivity or arbitrariness of the system choice is forgotten.) If the fit is still not perfect, this imperfection eventually becomes apparent. Alternative, logically competing systems are again explored. Finally, the expenditure of energy involved probably precludes frequent collective postformal choices; so individual searches for best-fit systems go on. Social change may result. Success, that is, construction of a formal reality system that fits with reality in a particular content area, would most likely lower the use of relativistic operations in the area but increase their use in other areas. But there is no limit to use of relativistic operations in understanding interpersonal relations in which one takes part, because the nature of the reality is constantly changing, as a function of being known by the participants.

While some have compared postformal self referential thought to simple relativism or to dialectical thought, it goes beyond

those two forms. Simple relativism (e.g., Perry, 1975) leads to the conclusion that one's choice of truth is totally arbitrary because truth cannot be known; postformal thought concludes that truth can be known and choices can be made because one can know the process by which any formal truth comes to be true. Dialectical thought (e.g., Basseches, 1984), leading to a synthesis of opposites, also differs from postformal self referential thought. The former leads to understanding of higher-order organization of opposites; the latter leads to awareness that the "rules of the game" of synthesizing a new truth are decided by the players as they play that truth game together. But despite the differences among relativism, dialecticism, and postformal self referential thought on general theoretical levels, there are many similarities and in a given context all three might predict the same conclusions.

Responses of an individual in a given situation can be scored for presence or absence of the operations which together indicate postformal thought (see Sinnott, 1984, 1989ab). These operations include metatheory shift, problem definition, process/product shift, parameter setting, and multiple solutions and methods, among others (see Appendix 1 and Sinnott, 1984, 1989b, 1991a). A summary of the genesis and results of postformal thought is in Figure 1.

Insert Figure 1 here

Postformal thought could allow the mature thinker to know that s/he is operating by two or more different logics or realities while seeking higher awareness, and to be comfortable with that knowing. The spiritual seeker who experiences all persons as Buddha, all places as Nirvana, all sounds as Mantra is either totally out of touch with reality or much more able to orchestrate multiple realities by virtue of a special logical ability to jump out of the system in the individual mind. How beautiful if one of the little cosmic designs includes a logical skill by which we can leave the prison of our own logic to view it from the outside!

The spiritual yearnings that accompany generativity and integrity for many persons (Erikson, 1950; Frankl, 1963; Gould, 1978) often sound like this postformal thought, as do the comments of wise ones, mystics, saints. Underhill (1961) writes that the mystic lives in a world unknown to most others, where he or she sees through the "veil of imperfection" and sees creation with God's eyes. They are "lifted out of self," to a "higher self." There is a sense of choice about whether one lives in the real or the illusion views of life. The shaman walks in upper and lower worlds, as animal spirit and human spirit self, simultaneously. Don Gennaro (Castaneda, 1981) can choose to see

in a unitative way, with the eyes of the sorcerer, or see in the ordinary way; he can violate physical laws, or obey them. The yearners say that they "want to know" and that they share in all of being. To sustain these views takes the ability to coordinate multiple contradictory formal logical systems, and to be able to self referentially choose one to commit to at a given moment.

Some Testable Hypotheses

Relating Postformal Cognition and Spirituality

Let me briefly describe four sample hypotheses with which we could test some relations between postformal cognition and high-level spiritual development.

1. Individuals who report a unitative state of consciousness show postformal operations (see Appendix); those not reporting unitative states may or may not show postformal operations. One might sample university students, the public at large, religious leaders, older adults labeled "wise" or master transpersonal therapists to find individuals reporting unitative states, then test them on postformal thought. Conversely, one might hypothesize that postformal thinkers are more likely to have unitative states of consciousness than nonpostformal thinkers. This latter hypothesis actually reflects the supposed direction of causality, that the cognitive skill allows the unitative state to be conscious and reportable. (But it is more fun to talk to all the advanced souls one could test using hypothesis variation number one.)

2. Those reporting unitative states have highly efficient styles of processing large amounts of conflicting information and function better in the face of that overload than those not reporting such states. I hypothesize this relation because of the underlying postformal thought components which organize disparate realities more effectively.

3. Middle-aged and older persons, whose life tasks include developing Erikson's generativity and integrity, are more likely to describe spiritual searches which link them with others and which operate to give a unity and meaning to their lives than younger persons. They are even more likely to do so if they have access to postformal operations. The rationale for this hypothesis is that underlying postformal cognitive skills give a similar <u>form</u> to personality development and spiritual development, both of which serve the good or adaptivity of the person.

4. <u>Choice</u> of exposure to life events or workshops or psychotherapy where one challenges the meaning of one's life or the grounds of one's "self" are likely to allow the person to transition to both postformal thought and spiritual development. The rational for this hypothesis is that a challenge of serious magnitude is needed to motivate reorganizing complex cognitive structures with concomitant ability to articulate aspects of deeper spiritual development.

Some Difficulties in Studying Relations Between Cognitive and Spiritual Development

Below are listed several difficult aspects of all these proposed studies.

1. It is difficult to reach agreement on what constitutes spiritual development, unitative experiences, etc. Operational definitives need to be crafted carefully.

2. If we're researching an "advanced" cognitive or spiritual state, relatively few persons will have experienced it. We'll need large samples to find enough target respondents. Few will read the reports with understanding, review proposals or journal articles favorably, or generally support the effort.

3. Cognition, spirituality, and science have traditionally been split apart. Trying to bridge among them frightens people with fears of reductionism or bad science.

4. Some say we should NOT even try to study these things because this is really a question of a given religion, or this is really a matter of arbitrary values, not science.

Spirituality and spiritual yearnings cross cultures and religions and can be seen in some form in all human groups. Nothing is value free; science has its own values and paradigms. All behavior is open to scientific investigation. To study a facet of a topic is not to declare one has studied the whole thing. It appears that none of these difficulties mentioned above is sufficient to keep us from doing some innovative and

"clean" research on cognitive aspects of spiritual development. Are we ready for this challenge?

References

Arlin, P. (1975). Cognitive development in adulthood: A fifth stage? Developmental Psychology, 11, 602-606.

Armstrong, J. (1991). Keeping one's balance in a moving system: The effects of the multiple personality disordered patient on the cognitive development of the therapist. In J. Sinnott & J. Cavanaugh (Eds.), Bridging paradigms: Positive development in adulthood and cognitive aging (pp.11-18). New York: Praeger.

Bach, R. (1977). Illusions: Adventures of a reluctant messiah. NY: Dell.

Basseches, M. (1984). Dialectical thinking and adult development. NJ: Ablex.

Bastick, T. (1982). Intuition: How we think and act. New York: Wiley.

Castaneda, C. (1981). A separate reality. New York: Washington Square Press.

Chinen, A. (1992). Once upon a midlife. CA: Tarcer.

Churchman, C. (1971). The design of inquiring systems: Basic concepts of systems and organizations. New York: Basic Books.

Commons, M. & Richards F. (1984). A general model of stage theory. In M. Commons, F. Richards & C. Armon (Eds.), Beyond formal operations: Late adolescent and adult development (pp. 120-140). New York: Praeger.

Commons, M., Armon, C., Kohlberg, L., Richards, F., Grotzer, T., Sinnott, J.D. (Eds.) (1989). Beyond formal operations III: Models and methods in the study of adult and adolescent thought. New York: Praeger.

Commons, M., Richards, F. & Armon, C. (Eds.) (1989). Adult development II: Comparisons and applications of adolescent and adult developmental modesl. New York: Praeger.

Demick, J. (Ed) (1992). Development in the workplace. NJ: Erlbaum.

Erikson, E. (1950). Childhood and society. New York: Norton.

Frankl, V. (1963). Man's search for meaning. New York: Washington Square Press.

Furth, H. (1969). Piaget and knowledge. NJ: Prentice-Hall.

Gould, R. (1978). Transformation. New York: Simon & Schuster.

Gowan, J. C. (1980). Operations of increasing order. Published by the author, 1426 Southwind Circle, Westlake Village, CA.

Hugo, V. (1938). Les miserables. (Translated by Lascelles Wraxall.) New York: Heritage Press.

Inhelder, B. & Piaget, J. (1958). The growth of logical thinking from childhood to adolescence. New York: Basic Books.

Isen, A. & Shalker, T. (1982). Effects of feeling state on evaluation of positive, neutral, and negative stimuli: When you "accentuate the positive," do you "eliminate the negative"? Social Psychology Quarterly, 45, 58-63.

Johnson, L. (1991). Postformal reasoning facilitates behavioral change: A case study of an international development project. In Sinnott & J. Cavanaugh (Eds.), Bridging paradigms: Positive development in adulthood and cognitive aging (pp. 59-72). New York: Praeger.

Koplowitz, H. (1984). A projection beyond Piaget's formal operational stage: A general systems stage and a unitary stage. In M. Commons, F. Richards & C. Armon (Eds.), Beyond formal operations: Late adolescent and adult cognitive development. (pp. 272-295). New York: Praeger.

Labouvie-Vief, G. (1984). Logic and self regulation from youth to maturity: A model. In M. Commons, F. Richards & C. Armon (Eds.), Beyond formal operations: Late adolescent and adult cognitive development (pp. 158-179). New York: Praeger.

Laughlin, P. R. (1965). Selection strategies in concept attainment as a function of number of persons and stimulus display. Journal of Experimental Psychology, 70, 323-327.

Laughlin, P. R. & Bitz, D. S. (1975). Individual vs. dyadic performance on a disjunctive task as a function of initial ability level. Journal of Personality and Social Psychology, 31, 487-496.

Laughlin, P. R., McGlynn, R. P., Anderson, J. A., & Jacobson, E. S. (1968). Concept attainment by individuals vs. cooperative pairs as a function of memory, sex, and concept rule. Journal of Personality and Social Psychology, 8, 410-417.

Lee, D.M. (1991). Relativistic operations: A framework for conceptualizing teachers' everyday problem solving. In J.Sinnott & J. Cavanaugh (Eds.), Bridging paradigms: Positive development in adulthood and cognitive aging (pp.73-86). New York: Praeger.

Luszcz, M. A. & Orr, R. L. (1991). Constructed knowing and everyday problem solving in adults. Paper presented at the 12th Biennial Lifespan Conference, West Virginia University, Morgantown, WV.

Meacham, J. & Emont, N. (1989). The interpersonal basis of everyday problem solving. In J. D. Sinnott (Ed.), Everyday problem solving: Theory and application (pp. 7-23). New York: Praeger.

Miller, J. (1978). Living systems. New York: Basic Books.

Ornstein, R. (1991). The evolution of consciousness. New York: Prentice-Hall.

Pearce, J. C. (1973). The crack in the cosmic egg. New York: Pocket Books.

Perry, W. B. (1975). Forms of intellectual and ethical development in the college years: A scheme. New York: Holt, Rinehart & Winston.

Rogers, D., Sinnott, J. D. & Van Dusen, L. (1991). Marital adjustment and social cognitive performance in everyday logical problem solving. Paper presented at the Sixth Adult Development Symposium, Boston, MA.

Sinetar, M. (1986). Ordinary people as monks and mystics: Lifestyles for self discovery. Mahwah, NJ: Paulist Press.

Sinnott, J. D. (1981). The theory of relativity: A metatheory for development? Human Development, 24, 293-311.

Sinnott, J. D. (1984). Postformal reasoning: The relativistic stage. In M. Commons, F. Richards, & C. Armon (Eds.), Beyond formal operations: Late adolescent and adult cognitive development. (pp. 288-315). New York: Praeger.

Sinnott, J. D. (Ed.) (1987). Sex roles in adulthoods and old age. In D. Bruce Carter (Ed.), Current conceptions of sexroles and sex typing, (pp. 155-180). New York: Praeger.

Sinnott, J. D. (1988). "Noncognitive" processes in problem solving: Are there age differences in use of emotion, personal history, self evaluation and social factors during combinatorial problem solving? Paper presented at the Second Cognitive Aging Conference, Atlanta, GA.

Sinnott, J. D. (Ed.). (1989a). A model for the solution of illstructured problems: Implication for everyday and abstract problem solving. In J.D. Sinnott (Ed.), Everyday problem solving: Theory and applications (pp. 72-99). New York.: Praeger.

Sinnott, J. D. (1989b). Adult differences in use of postformal operations. In M. Commons, J. D. Sinnott, F. Richards, & C. Armon (Eds.), Beyond formal operations II (pp. 239-278). New York: Praeger.

Sinnott, J. D. (Ed.) (1989c). Everyday problem solving: Theory and application. New York: Praeger.

Sinnott, J. D. (1989d). Lifespan relativistic postformal thought: Methods and data from everyday problem solving studies. In M. Commons, J. Sinnott, F. Richards, & C. Armon (Eds.), Adult development: Comparisons and applications of developmental models (pp. 239-278). New York: Praeger.

Sinnott, J. D. (1991a) "Noncognitive" processes in problem solving: Are there age differences in use of emotion, personal history, self evaluation or social factors? In J.D. Sinnott & J. Cavanaugh (Eds.), Bridging paradigms: Positive development in adulthood and cognitive aging (pp. 169-202). New York: Praeger

Sinnott, J. D. (1991b). Scoring protocols for self-referential postformal thought. Workshop presented at the Sixth Adult Development Symposium, Suffolk University, Boston.

Sinnott, J. D. (1991c). What do we do to help John? A case study of postformal problem solving in a family making decisions about an acutely psychotic member. In J. Sinnott & J. Cavanaugh (Eds.), Bridging paradigms: Positive development in adulthood and cognitive aging (pp. 203-220). New York: Praeger.

Sinnott, J. D. (1992a). Teaching in a chaotic new physics world: Teaching as a dialogue with reality. In P. Kahaney, J. Jananglo, & L.A.M. Perry (Eds.), Teachers and change: Theoretical and practical perspectives. NJ: Ablex Press.

Sinnott, J. D. (1992b). The use of complex thought and solving intragroup conflicts: Means to conscious adult development in the workplace. In J. Demick (Ed.), Development in the workplace (pp. 155-175). NJ: Erlbaum.

Sinnott, J. D. (1993). Test of Postformal Thought: Computer Version. Available from author, Psychology Dept., Towson State University, Baltimore, MD 21204

Sinnott, J. D. (in press a). Creativity and postformal thought: Why the last stage is the creative stage. In C. Adams-Price (Ed.), Creativity and aging: Theoretical and empirical approaches. NY: Springer.

Sinnott, J. D. (Ed.) (in press b). Interdisciplinary handbook of adult lifespan learning. CT: Greenwood Press.

Sinnott, J. D. (in press c). New science models for teaching adults: Teaching as a dialogue with reality. In J. Sinnott (Ed.), Interdisciplinary handbook of adult lifespan learning. CT: Greenwood.

Sinnott, J. D. (in press d). Postformal thought, adult learning, and lifespan development: How are they related? In J. Sinnott (Ed.), Interdisciplinary handbook of adult lifespan learning. CT: Greenwood.

Sinnott, J. D. (in press e). The longterm future of adult lifespan learning: Making the most of adults in times of change. In J. Sinnott (Ed.), Interdisciplinary handbook of adult lifespan learning. CT: Greenwood.

Sinnott, J. D. (in press f). Yes, it's worth the trouble! Unique contributions from everyday cognition studies. In H. Reese & J. Puckett (Eds.), Lifespan developmental psychology: Mechanisms of everyday cognition. NJ: Erlbaum.

Sinnott, J. D. & Cavanaugh, J. (1991) (Eds.), Bridging paradigms: Positive development in adulthood and cognitive aging. New York: Praeger.

Tanon, F. (1991). The influence of formal vs. informal education on planning skills: A cultural perspective. In J. Sinnott & J. Cavanaugh (Eds.). Bridging paradigms: Positive development in adulthood and cognitive aging (pp. 221-236). New York: Praeger.

Tart. C. (1983). State of consciousness. San Rafael, CA: Psychological Processes, Inc.

Underhill, E. (1961). Mysticism. New York: Dutton.

Figure 1

Relativistic Thought: Genesis, Effects, and Behavioral Evidence

GENESIS: Process of shared cognition of social experiences

PERSONAL LEVEL: Postformal relativistic thought

EVIDENT IN:

-Solution of practical problems

-Consciously altered states of consciousness

-Advanced scientific thought

-Interpersonal relations having flexibility and empathy

-Complex information processing

BIOLOGICAL SUBSTRATIUM:

Epigenetic encoding of adaptive behavior

SOCIAL SUPERSTRATUM:

Groups and societies act and change in line with their shared cognitions

(From Sinnott, 1984)

Appendix 1

Criteria for Relativistic, Self-Referential Postformal Operations

1. Metatheory shift: There is the production of abstract and practical (real-life) solutions as well as a shift between conflicting abstract a priori and real a priori. This shift is stated by the subject. The solution always includes problem definitions. For example, the subject might ask whether we want the hypothetical solution that is logical on paper or the solution that would really be viable. (The respondent may or many not then proceed to give both solutions.)
2. Problem definition: There is a statement of the meaning and demands of the problem for the subject. There is also the decision to define problems in a certain, chosen way. The subject indicates a change in the types of parameters from solution to solution. Defining the problem is the first concern, but the subject need not give alternative solutions since these solutions might be precluded by the problem definition. The problem definition may include a metatheory shift. For example, the subject might wonder what the real problem is, whether it is the need to have peace in the family or to use all the space. The subject might then decide to treat it like an algebra problem.
3. Process/product shift: This is a description of a process as one answer and an outcome as another answer. Or there may be

a description of two processes that achieve the same outcome. Often there is a statement by a subject that there is a solution and that finding the solution is actually a never-ending process.

4. Parameter setting: The subject names key variables to be combined or made proportional in the problem other than those given in the written demands of the problem. Often the subject explicitly writes out key variables. Alternatively she or he may change the variables that limit the problem from solution 1 to solution 2. Parameter setting differs from problem definition in that it is less inclusive and more concrete.
5. Pragmatism: One can choose a best solution among several, or, one can choose the best variant of a solution that has two processes. For example, the subject might say that if you want the most practical solution, it's number 2, but if you want the quickest, easiest solution, it's number 1. This is the only operation that cannot be given a passing score unless the subject actually gives more than one solution.
6. Multiple solutions: There is a direct statement that there are many correct solutions intrinsic to a problem with several causes, or that no problem has only one solution. Also, the subject may create several solutions. For example, the subject might respond that he or she sees four solutions that could be termed correct, or that there are limitless

arrangements that would be correct if you change the constraints.

7. Multiple causality: There is a statement that multiple causes exist for any event or that some solutions are more probable than others. For example, some subjects state that the solution depends on all past relations of the persons in the problem, such as, when the three persons in the problem get together anything could happen, depending on personalities and on how each reacts.
8. Paradox: The subject gives a direct statement or question about perceived, inherently conflicting demands that are integral to the problem, not simply two solutions with different parameters. For example, the Bedroom Problem can be read in two conflicting ways. The subject notices that two different things are being said at once, both of which could change the way the problem should be solved.
9. Self referential thought: Awareness that the subject must be the ultimate judge of which belief system dominated his/her thinking, i.e., of what is "True". For example, the subject might say that she, a therapist, can never be free of a bias but can only be aware of which bias is coloring her view of a client. But all the views are "true", and she must choose one and go on with the treatment sessions.